WHAT IS CLAIMED IS:

1. A semiconductor manufacturing apparatus comprising:

a silicon thin film formation chamber, an insulating thin film formation chamber, a laser irradiation chamber, a hydrogen annealing chamber and transportation means for transporting a substrate having planar dimensions of a substrate width by a substrate length,

wherein each of said chambers and said transportation means are constituted such that said substrate on which a semiconductor device is formed can be transported among said chambers without exposure of said substrate to the air; and

wherein said laser irradiation chamber includes an irradiation system and a vacuum chamber for accommodating the substrate, wherein the vacuum chamber has planar dimensions of a chamber length and a chamber width wherein at least one of the chamber length and chamber width is less than twice a respective length or width dimension of the substrate.

2. The semiconductor manufacturing apparatus of claim 1, wherein said substrate is held in a stationary position during laser irradiation in said laser irradiation chamber.

3. The semiconductor manufacturing apparatus of claim 1, wherein the irradiation system includes a laser and an optical system for shaping the laser beam, wherein a part of said optical system is movably disposed within said vacuum chamber such that the laser beam can be irradiated onto substantially the entire planar area of said substrate.

4. The semiconductor manufacturing apparatus of claim 1, wherein the vacuum chamber includes a window, said window having dimensions corresponding to a planar area of said substrate, wherein a laser from said irradiation system is passed over substantially the entire planar area of said substrate through said window.